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CURRENT LITERATURE.

BOOK REVIEWS.

Vegetable physiology.

THE NEED of a book of moderate compass to present in clear and succinct form the principles of plant physiology is well met by Professor Green's recent volume.¹ In a handy volume of 450 pages the author has discussed the structure and differentiation of the body (35 pp.); the skeleton (17 pp.); the absorption, transport and loss of water (50 pp.); aeration and respiration (29 pp.); the various processes of nutrition, including absorption and synthesis of foods, translocation, storage, digestion, secretion and waste products (156 pp.); energy relations (17 pp.); growth (15 pp.); temperature and the influence of environment on plants (25 pp.); irritability and movement (39 pp.). These are not the author's chapter headings but fairly represent the various topics. He has "endeavored to present the plant as a living organism, endowed with particular properties and powers, realizing certain needs, and meeting definite dangers," and to keep clearly before the reader the fundamental identity of the activities of plants and animals.

In general the presentation leaves little to be desired. Particularly commendable is the treatment of nutrition. The author not only lays stress upon the true nature of foods, from which category he rightly excludes water and carbon dioxid, but discusses clearly photosynthesis, from which he differentiates, none too strongly, the amylogenic function, and presents, as in his earlier work, an excellent chapter on digestion.

The treatment of respiration and the energy relations of plants, however, is not well arranged. To discuss respiration in connection with aeration and before nutrition seems to be a reversal of the logical sequence and that to no gain. It needs to be brought into intimate relation with nutrition, of which it is a phase, and also with the release of energy, of which it is one method. Aeration, though incidental to respiration, should be treated in connection with gas absorption, just as root hairs are discussed in connection with water absorption.

The handling of osmosis might be much improved by a broader physical treatment, for there is no process whose fundamental principles are so little comprehended by most students. The author seems to overestimate the importance of root pressure in the transport of water through the stems, for

¹ GREEN, J. REYNOLDS: An introduction to plant physiology. 8vo. pp. xx+459. *figs. 184*. London: J. and A. Churchill. 1900. 10s. 6d.

it certainly has no effect beyond the cortex of the root when transpiration is active. On the other hand, the presentation of the probable relation of evaporation and osmosis in the mesophyll to water transfer is very satisfactory.

The illustrations are remarkably unequal. Some are excellent; some are crude, but sufficient; some are so diagrammatic, without such remark, as to be misleading; and some disfigure a book which deserves the best possible engravings. We suspect some of the worst of being relics of a long-deceased "botany," resurrected from the publishers' stock-room. Many of the illustrations, though not original, are not credited to their sources, while others are; of this no explanation is given.

No references are made to original papers or to other works; only in a few cases is the proponent of any particular view or theory referred to; and controverted points are scarcely alluded to. The danger from this is that the student may get the too common impression that the book deals out finally settled knowledge. It is difficult to know where to draw the line between the necessary dogmatism of the elementary work and the discussion of the treatise, but we believe in showing up the gaps in a subject fully. While this book only professes to be "an introduction," it is nevertheless so thorough that it would have been improved by a *selected* bibliography following each of the various topics. For though we have Pfeffer's treatise at hand, its citations of literature are too detailed for the student of elementary physiology, and he would have profited greatly by the same judicious sifting of the literature as Professor Green has made of the facts.—C. R. B.

The problems of life.

THE FUNDAMENTAL problem of physiology is the constitution of living matter. But we are so far from a knowledge of the chemistry of proteids, not to mention protoplasm, that the best we can do now is to attempt the framing of logical and consistent hypotheses, in the hope that these will suggest research in fruitful lines. If the true character of such hypotheses is kept clearly in view, they may prove helpful, but there is always a danger that the hypothesis may be held so tenaciously that new facts are distorted to fit our interpretation of other facts.

There is before us the first part of a work by Dr. Giglio-Tos, of the University of Turin, which is an attempt to set forth a logical and consistent hypothesis of the organization of protoplasm and its fundamental functions, notably assimilation, reproduction, respiration, photosynthesis, and cell division.² A second part is to discuss ontology and its problems.

² GIGLIO-TOS, ERMANN0: Les problèmes de la vie: Essai d'une interpretation scientifique des phénomènes vitaux. 1^{re} partie: La substance vivant et la cytodièrese. 8vo. pp. viii + 286. figs. 33. Turin: The author, Palazzo Carignano. 1900. 10 francs.